

Supporting Information

**Light Induced Construction of Porous Covalent Organic Polymeric
Networks for Significant Enhancement of CO₂ Gas Sorption**

Soumitra Bhowmik,^a Maruthi Konda^a and Apurba K. Das^{*,a}

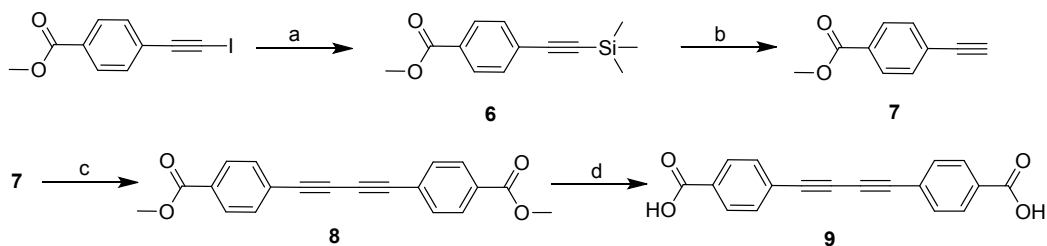
Department of Chemistry, Indian Institute of Technology Indore, Indore 453552, India.

*E-mail: apurba.das@iiti.ac.in

Table of Content

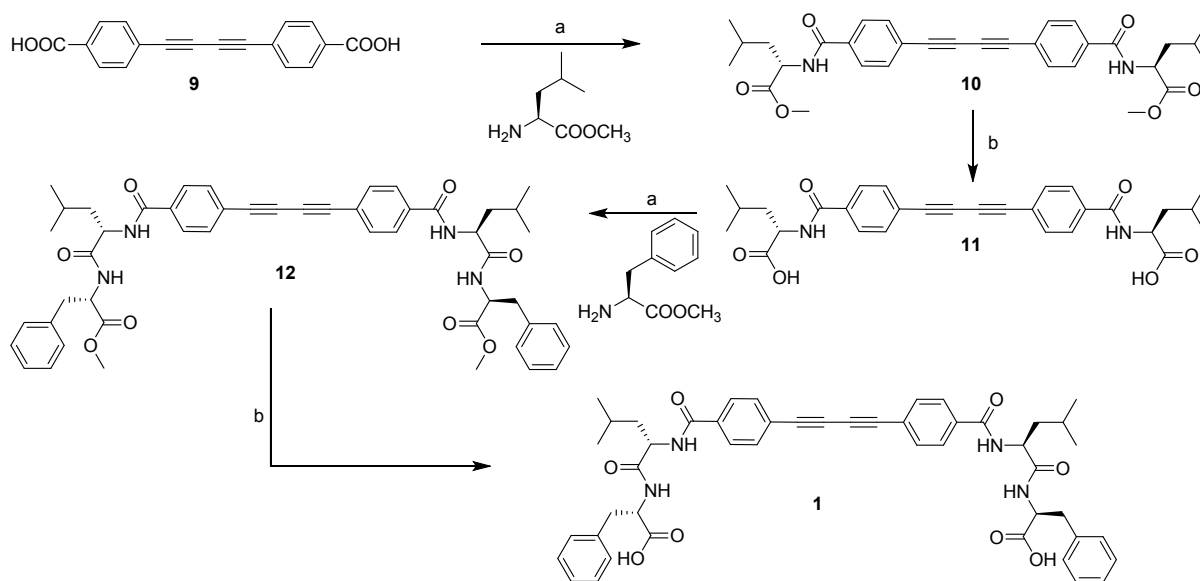
S. No.		Page No
1	Scheme S1 Synthetic scheme of compound 9	S3
2	Scheme S2 Synthetic scheme of compound 1	S3
3	Scheme S3 Synthetic scheme of compound 2	S4
4	Fig. S1 SEM images of compound 1 (a) before UV irradiation, (b) at 60 min of UV irradiation	S5
5	Fig. S2 SEM images of compound 1 (a) before UV irradiation and (d) at 60 min of UV irradiation	S5
6	Fig. S3 SEM images of compound 2 (a) before UV reaction and (e) after 60 min of UV irradiation	S5
7	Fig. S4 TGA curves for compound 1 , polymer 1 , compound 2 and polymer 2	S6
8	Fig. S5 ¹ H NMR spectrum (400 MHz, CDCl ₃) of compound 6	S7
19	Fig. S6 ¹ H NMR spectrum (400 MHz, CDCl ₃) of compound 7	S7
10	Fig. S7 ¹ H NMR spectrum (400 MHz, CDCl ₃) of compound 8	S8
11	Fig. S8 ¹ H NMR spectrum (400 MHz, DMSO- <i>d</i> ₆) of compound 9	S8
12	Fig. S9 ¹ H NMR spectrum (400 MHz, CDCl ₃) of compound 10	S9
13	Fig. S10 ¹³ C NMR spectrum (100 MHz, CDCl ₃) of compound 10	S9
14	Fig. S11 ¹ H NMR spectrum (400 MHz, DMSO- <i>d</i> ₆) of compound 11	S10
15	Fig. S12 ¹ H NMR spectrum (400 MHz, CDCl ₃) of compound 12	S10
16	Fig. S13 ¹³ C NMR spectrum (100 MHz, CDCl ₃) of compound 12	S11
17	Fig. S14 ¹ H NMR spectrum (400 MHz, DMSO- <i>d</i> ₆) of compound 1	S11
18	Fig. S15 ¹³ C NMR spectrum (100 MHz, DMSO- <i>d</i> ₆) of compound 1	S12
19	Fig. S16 ¹ H NMR spectrum (400 MHz, DMSO- <i>d</i> ₆) of compound 13	S12
20	Fig. S17 ¹³ C NMR spectrum (100 MHz, DMSO- <i>d</i> ₆) of compound 13	S13
21	Fig. S18 ¹ H NMR spectrum (400 MHz, DMSO- <i>d</i> ₆) of compound 2	S13
22	Fig. S19 ¹³ C NMR spectrum (100 MHz, DMSO- <i>d</i> ₆) of compound 2	S14
23	Fig. S20 ESI-MS spectrum of compound 8	S14
24	Fig. S21 ESI-MS spectrum of compound 10	S14
25	Fig. S22 ESI-MS spectrum of compound 11	S15
26	Fig. S23 ESI-MS spectrum of compound 12	S15
27	Fig. S24 ESI-MS spectrum of compound 1	S15
28	Fig. S25 ESI-MS spectrum of compound 13	S16
29	Fig. S26 ESI-MS spectrum of compound 2	S16

1. Synthesis of diphenylbutadiyne containing peptide bolaamphiphiles:



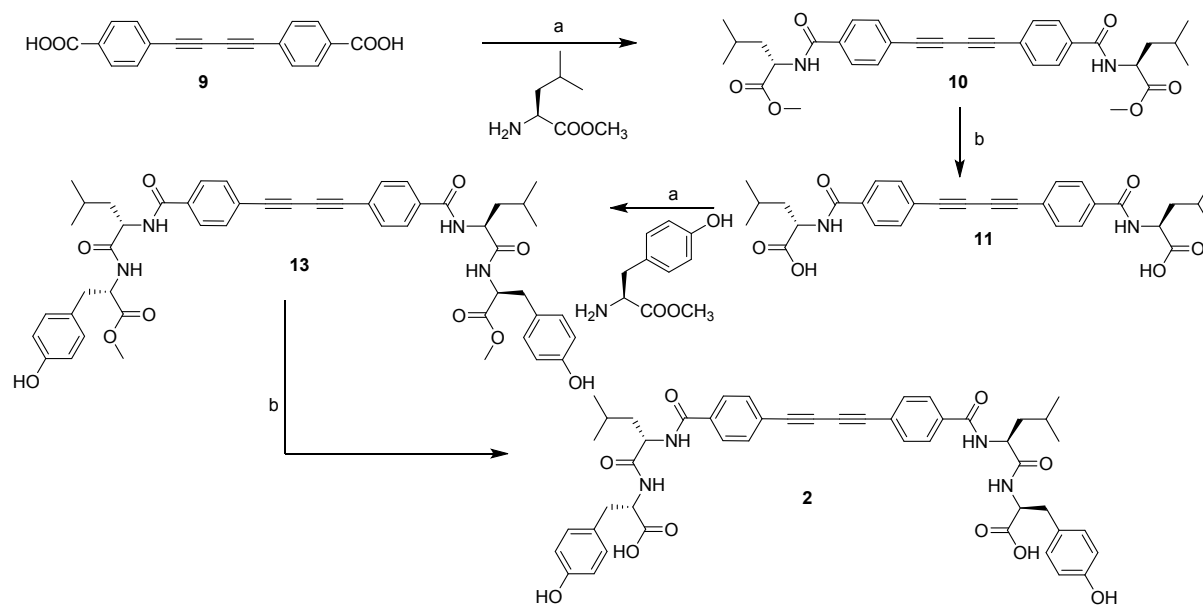
Reagents and conditions: (a) TMSA, Pd(PPh₃)₂Cl₂, CuI, Et₃N, 80 °C; (b) K₂CO₃/MeOH, rt; (c) CuCl/TMEDA, acetone, rt; (d) NaOH/THF, reflux.

Scheme S1 Synthetic scheme of 4,4'-(buta-1,3-diyne-1,4-diyl)dibenzoic acid **9**.



Reagents and conditions: (a) DCC, HOBt, DMF; (b) 2N NaOH, MeOH.

Scheme S2 Synthetic scheme of compound **1**.



Reagents and conditions: (a) DCC, HOBT, DMF; (b) 2N NaOH, MeOH.

Scheme S3 Synthetic scheme of compound **2**.

2. Morphological Study:

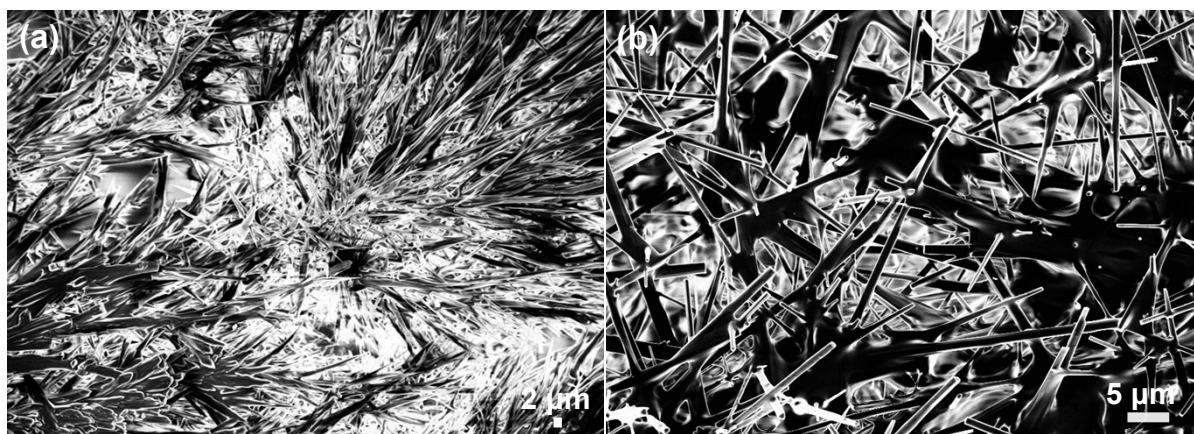


Fig. S1 SEM images of compound **1** (a) before UV irradiation, (b) at 60 min of UV irradiation. ($C = 15 \text{ mmol L}^{-1}$)

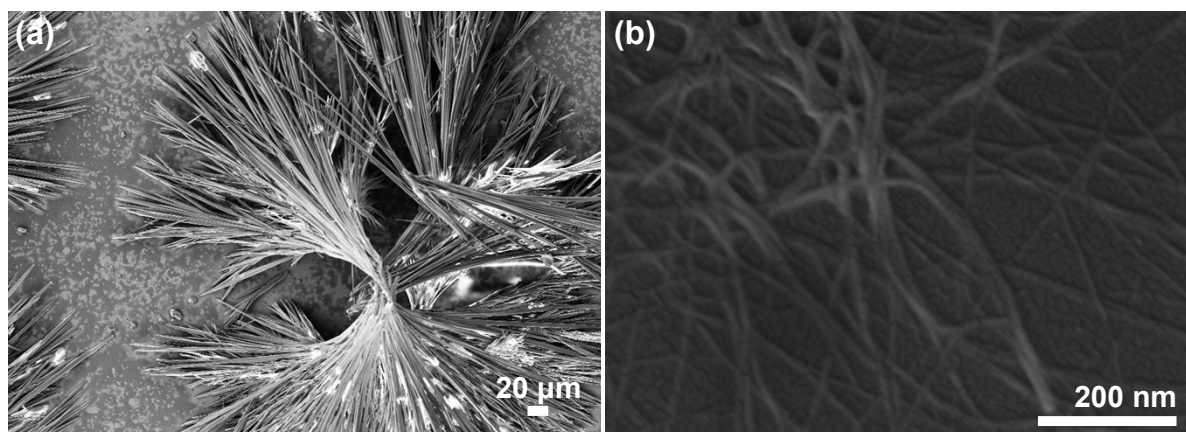


Fig. S2 SEM images of compound **1** (a) before UV irradiation and (d) at 60 min of UV irradiation. ($C = 30 \text{ mmol L}^{-1}$).

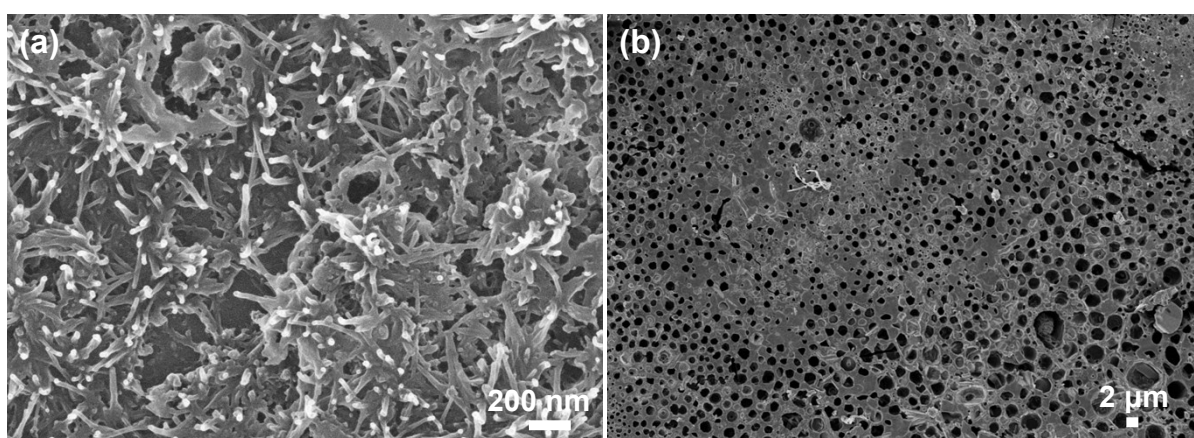


Fig. S3 SEM images of compound **2** (a) before UV reaction and (e) after 60 min of UV irradiation. ($C = 20 \text{ mmol L}^{-1}$)

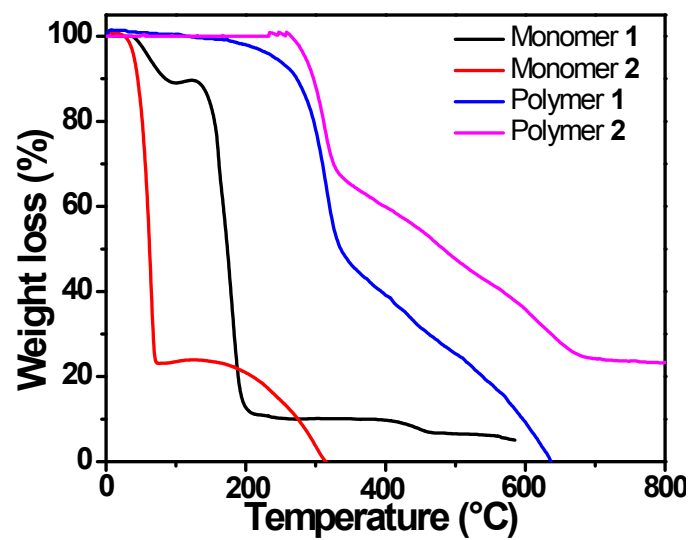


Fig. S4 TGA curves for compound 1, polymer 1, compound 2 and polymer 2.

3. NMR Spectra of all synthesized compounds:

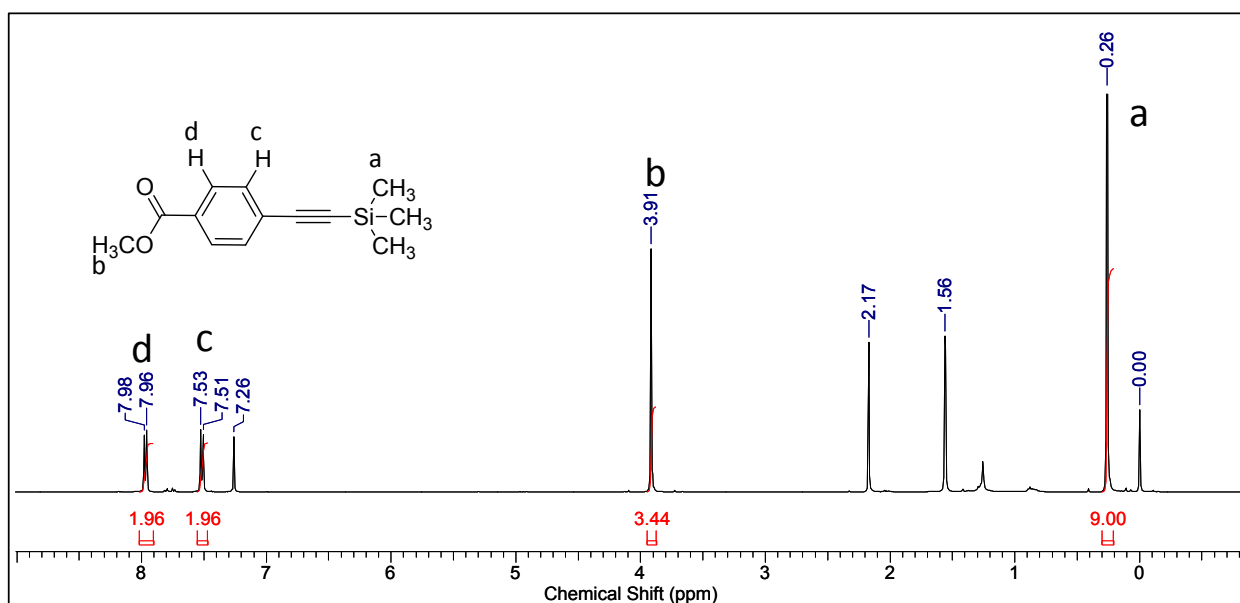


Fig. S5 ¹H NMR spectrum (400 MHz, CDCl₃) of compound 6.

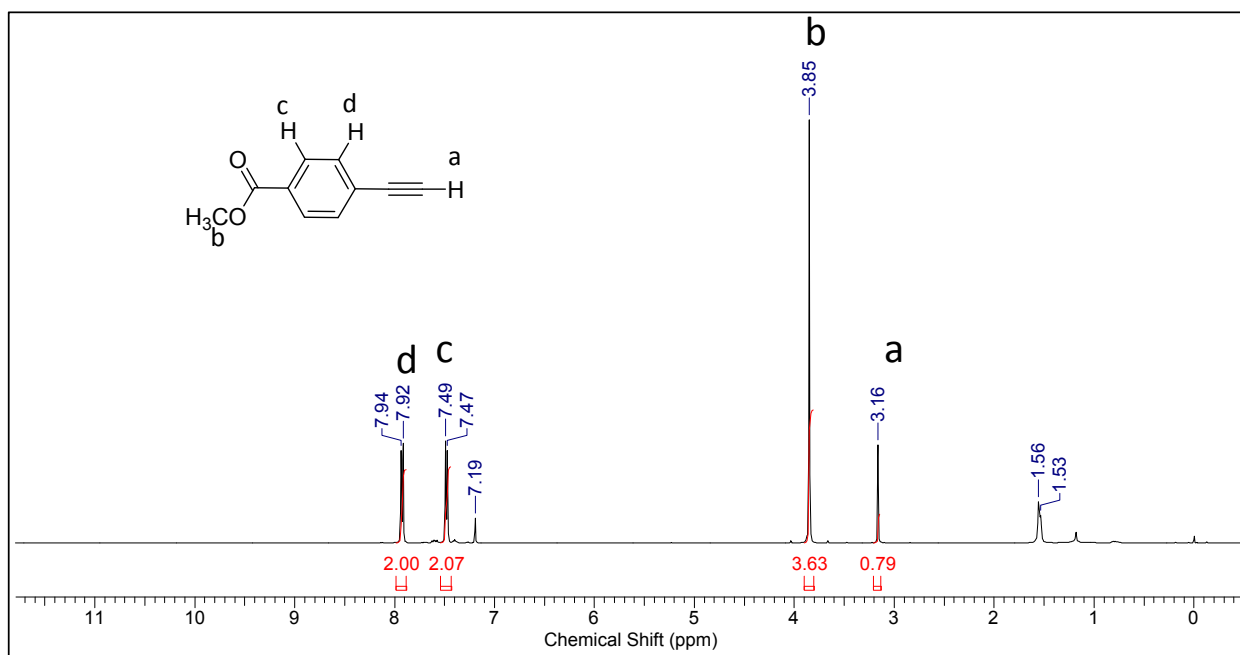


Fig. S6 ¹H NMR spectrum (400 MHz, CDCl₃) of compound 7.

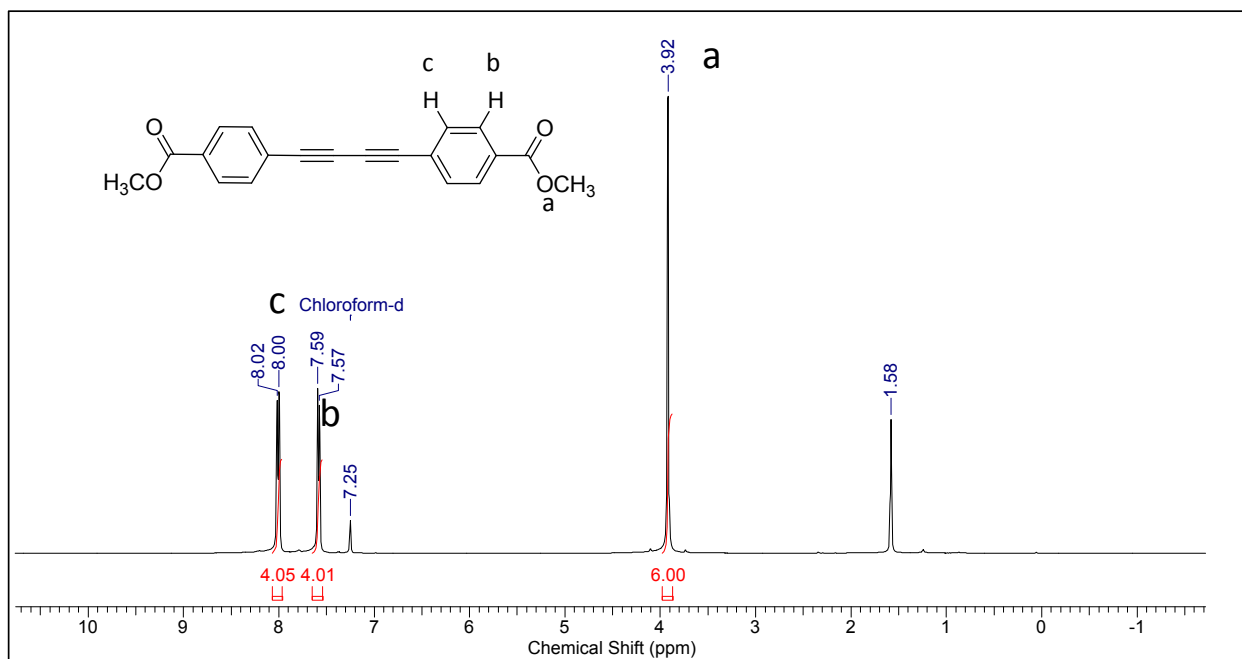


Fig. S7 ¹H NMR spectrum (400 MHz, CDCl₃) of compound **8**.

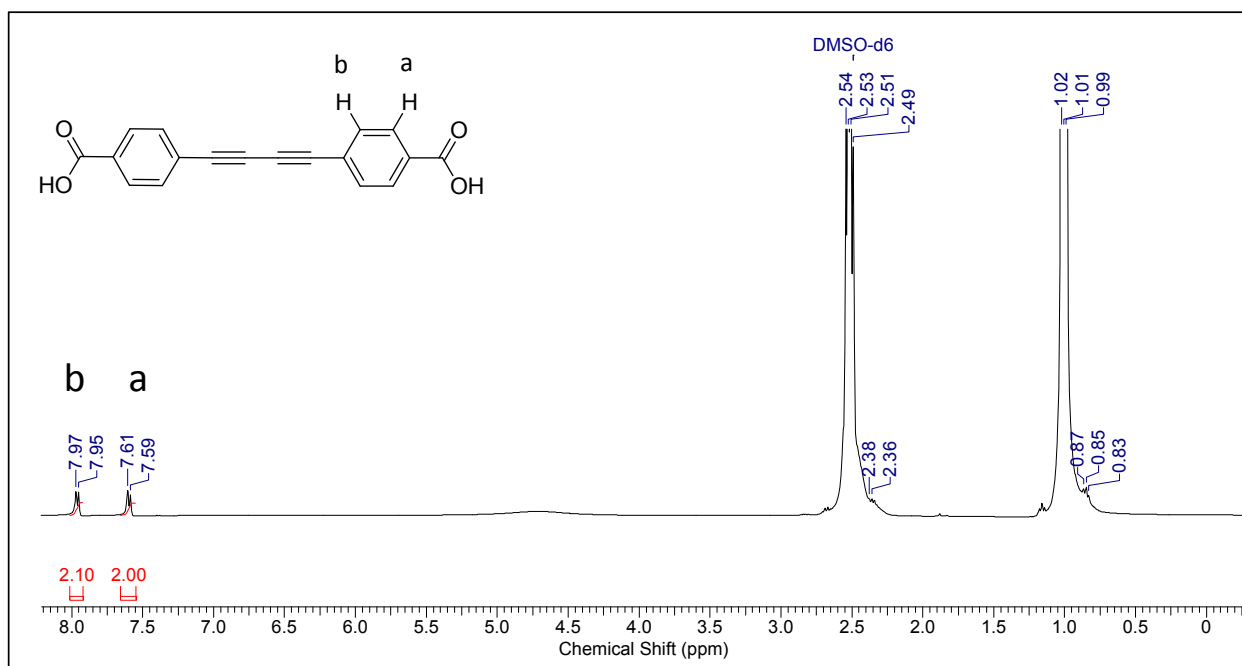


Fig. S8 ¹H NMR spectrum (400 MHz, DMSO-*d*₆) of compound **9**.

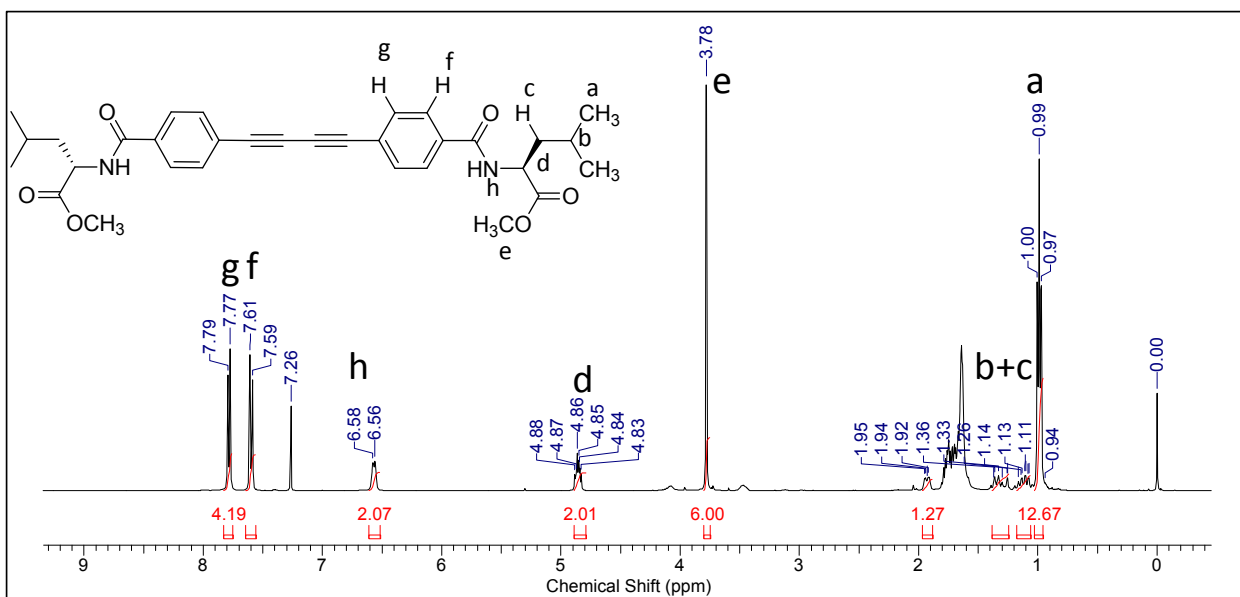


Fig. S9 ^1H NMR spectrum (400 MHz, CDCl_3) of compound 10.

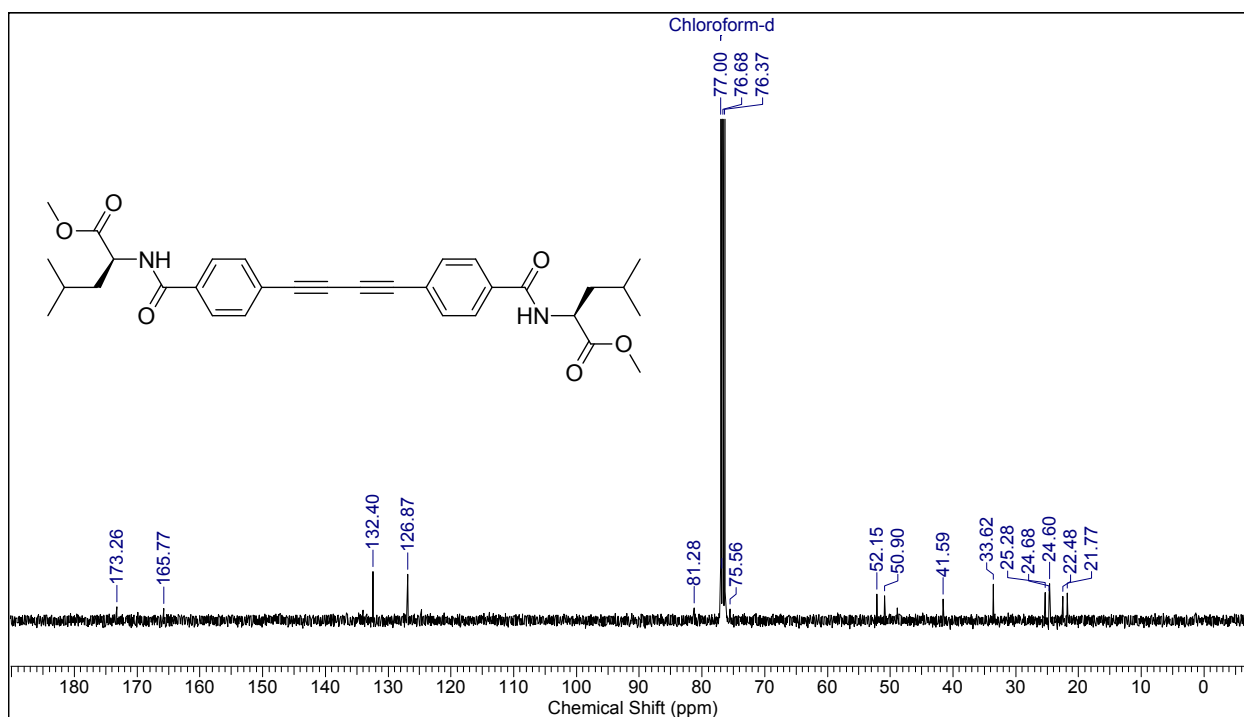


Fig. S10 ^{13}C NMR spectrum (100 MHz, CDCl_3) of compound 10.

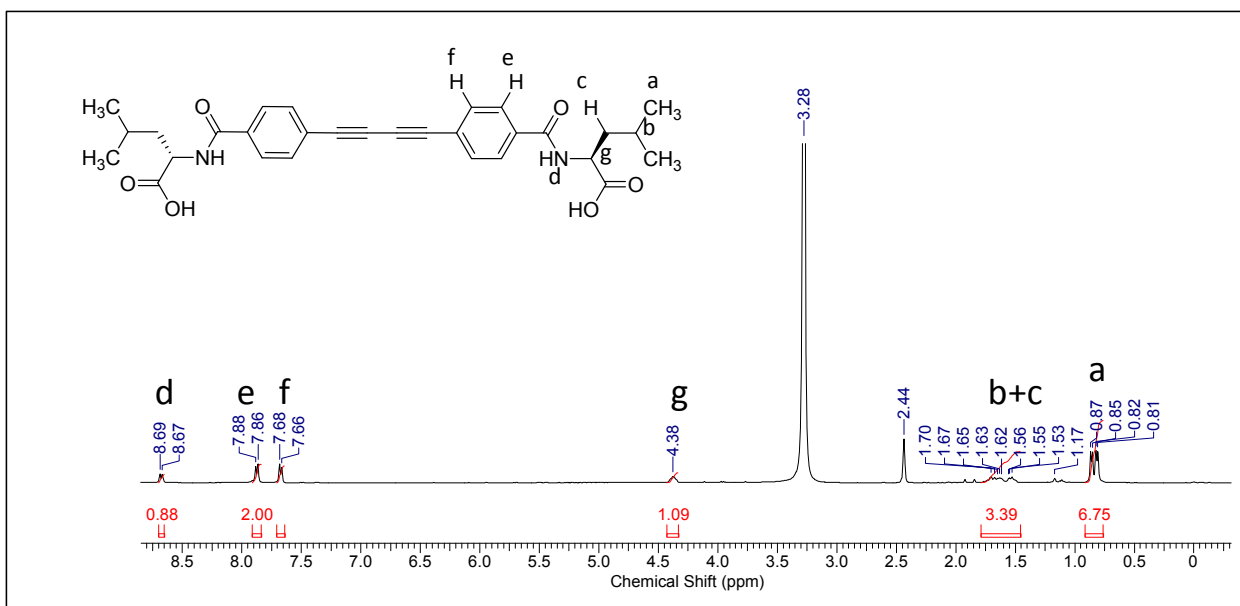


Fig. S11 ^1H NMR spectrum (400 MHz, $\text{DMSO}-d_6$) of compound 11.

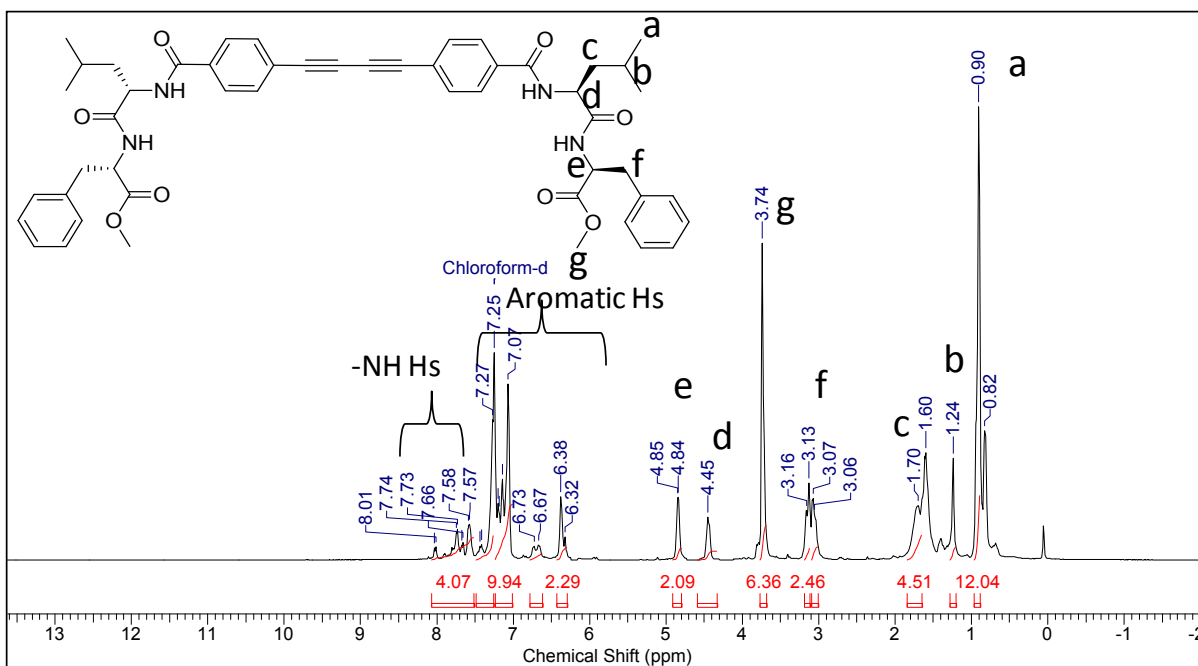


Fig. S12 ^1H NMR spectrum (400 MHz, CDCl_3) of compound 12.

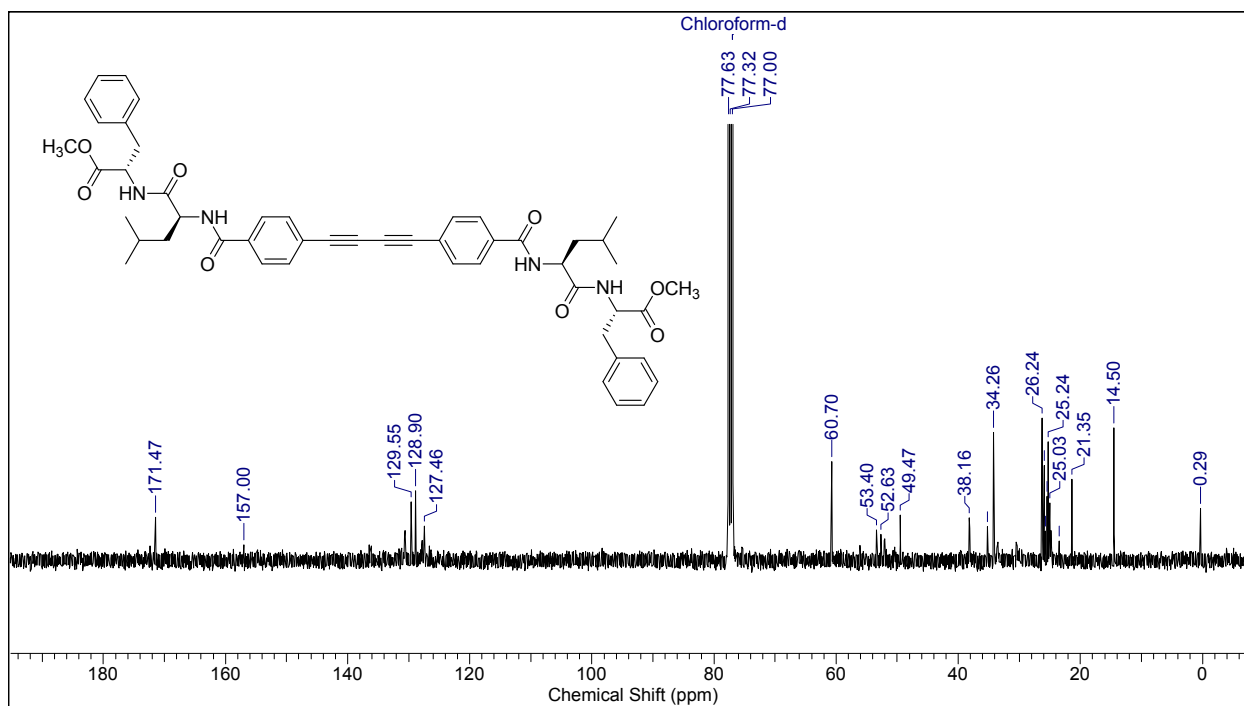


Fig. S13 ^{13}C NMR spectrum (100 MHz, CDCl_3) of compound **12**.

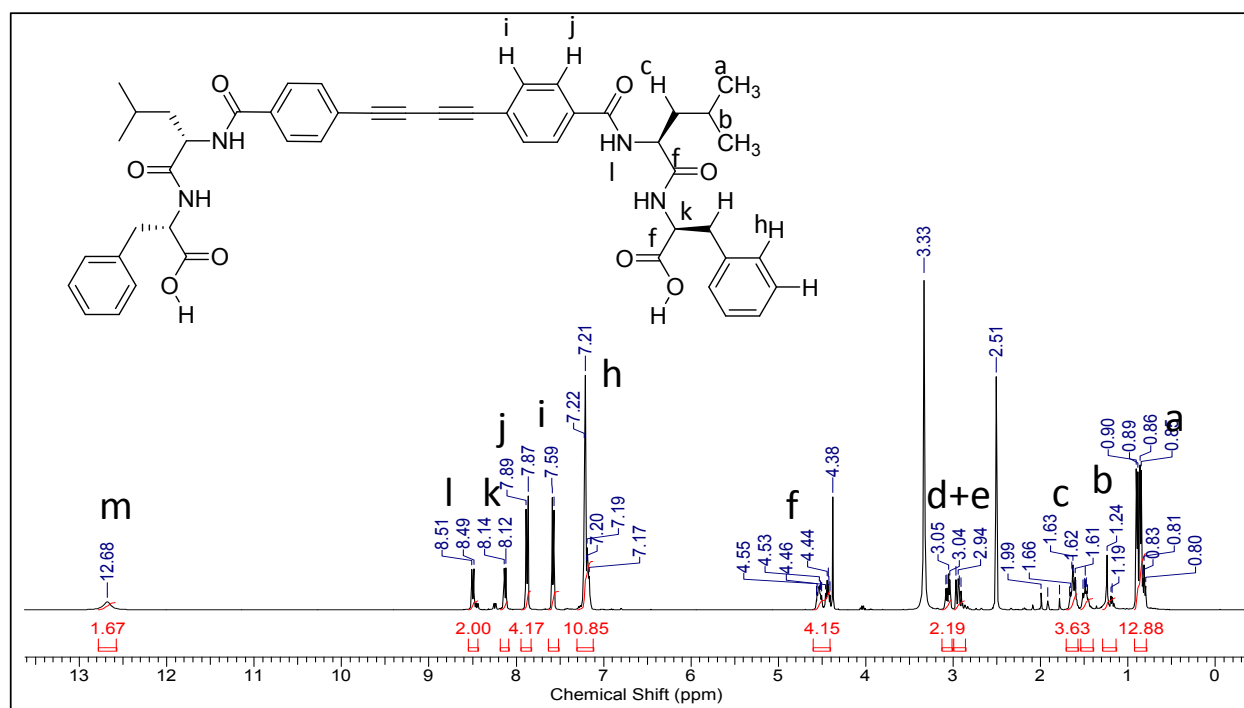


Fig. S14 ^1H NMR spectrum (400 MHz, $\text{DMSO}-d_6$) of compound **1**.

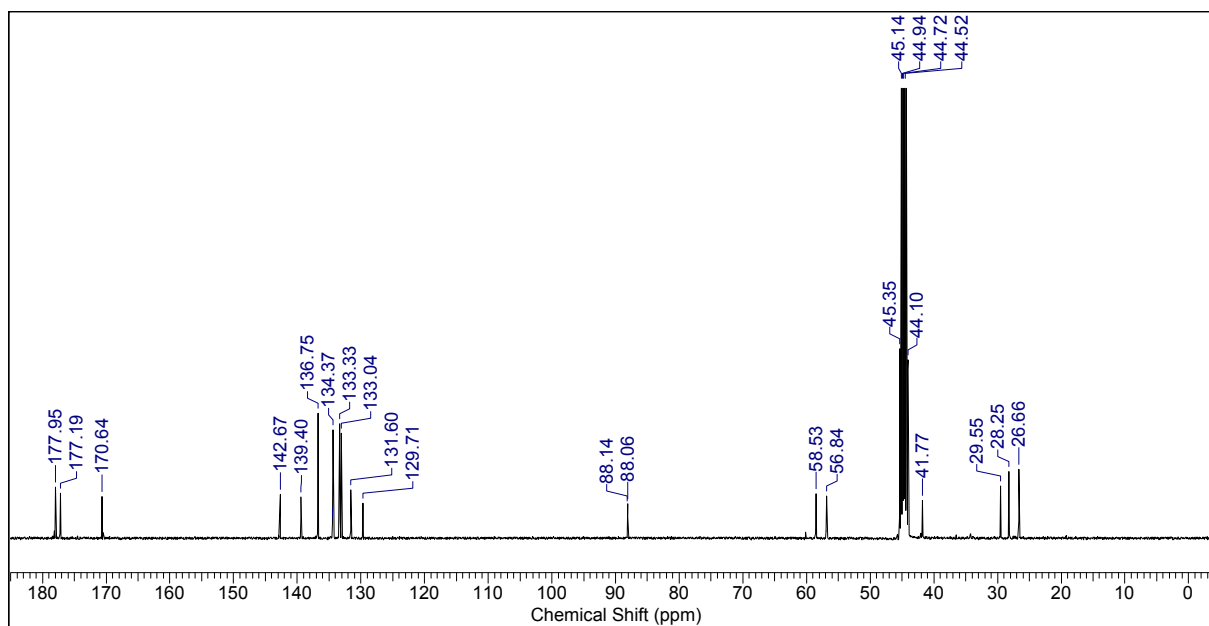


Fig. S15 ^{13}C NMR spectrum (100 MHz, $\text{DMSO-}d_6$) of compound **1**.

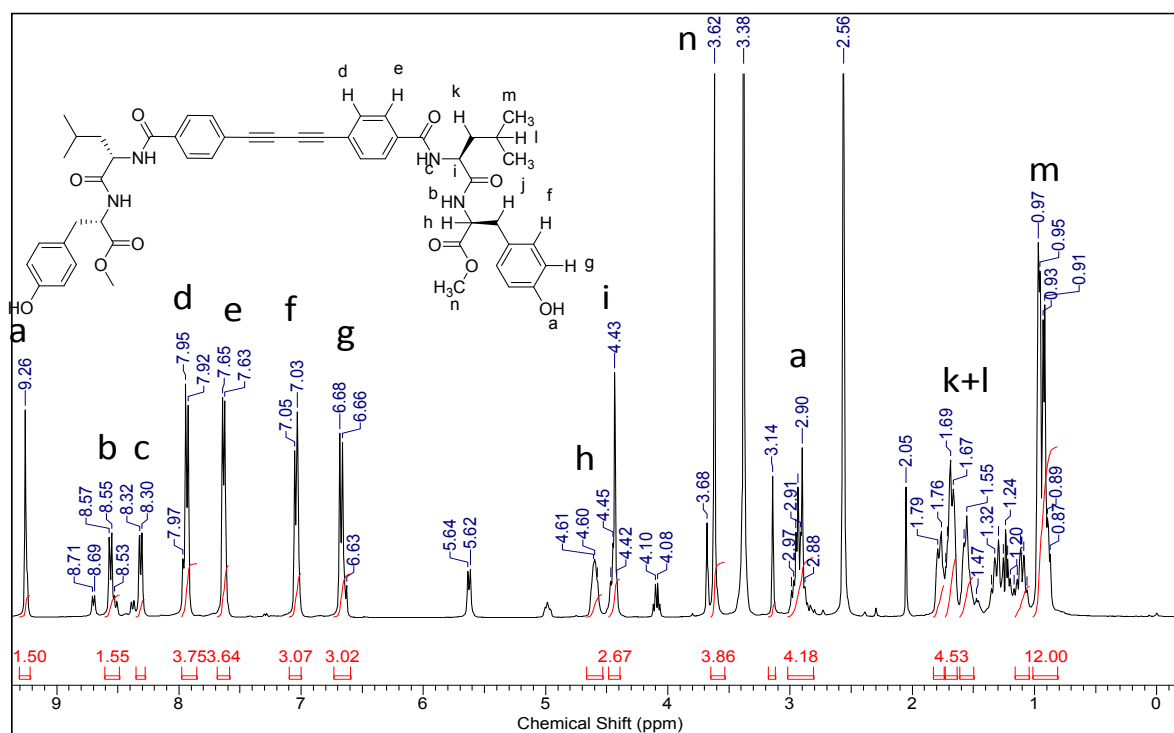


Fig. S16 ^1H NMR spectrum (400 MHz, $\text{DMSO-}d_6$) of compound **13**.

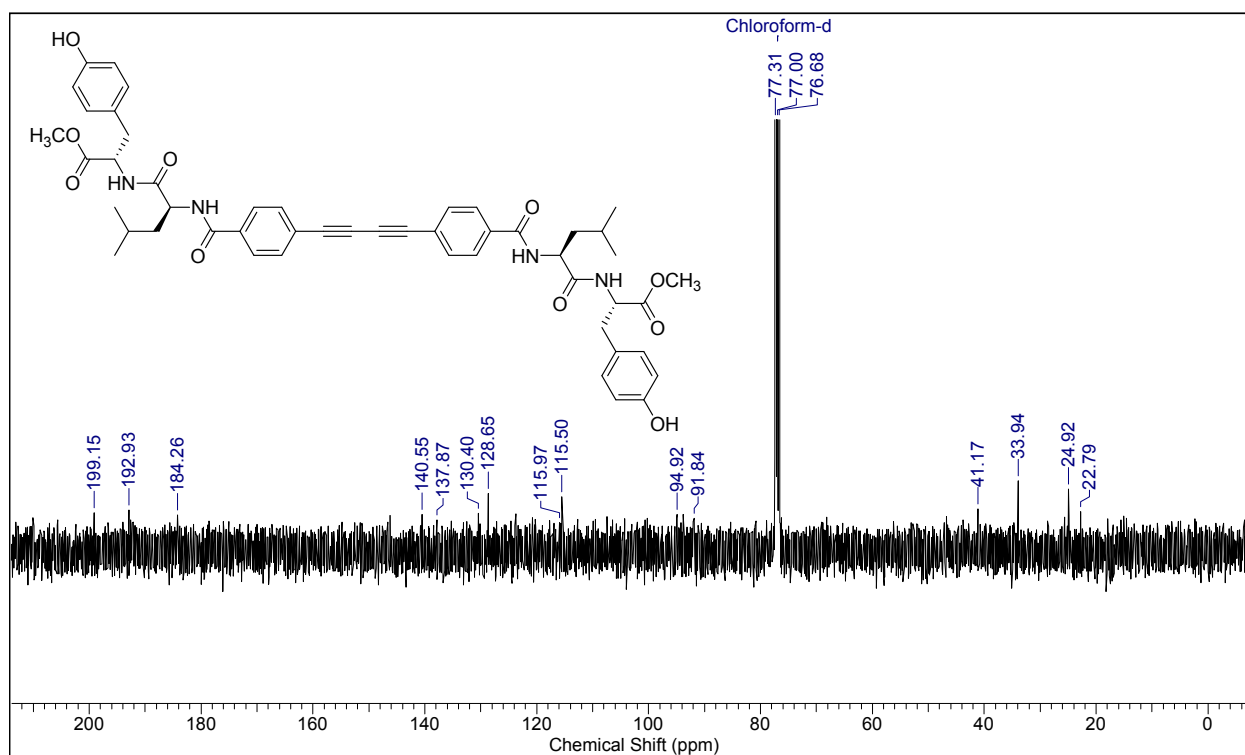


Fig. S17 ^{13}C NMR spectrum (100 MHz, $\text{DMSO}-d_6$) of compound **13**.

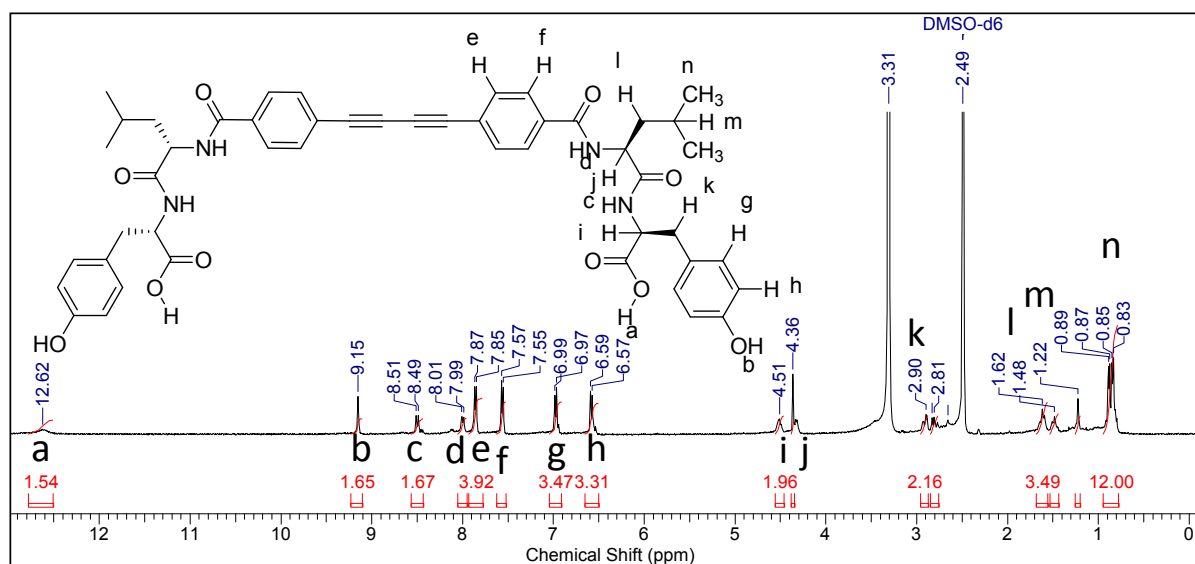


Fig. S18 ^1H NMR spectrum (400 MHz, $\text{DMSO}-d_6$) of compound **2**.

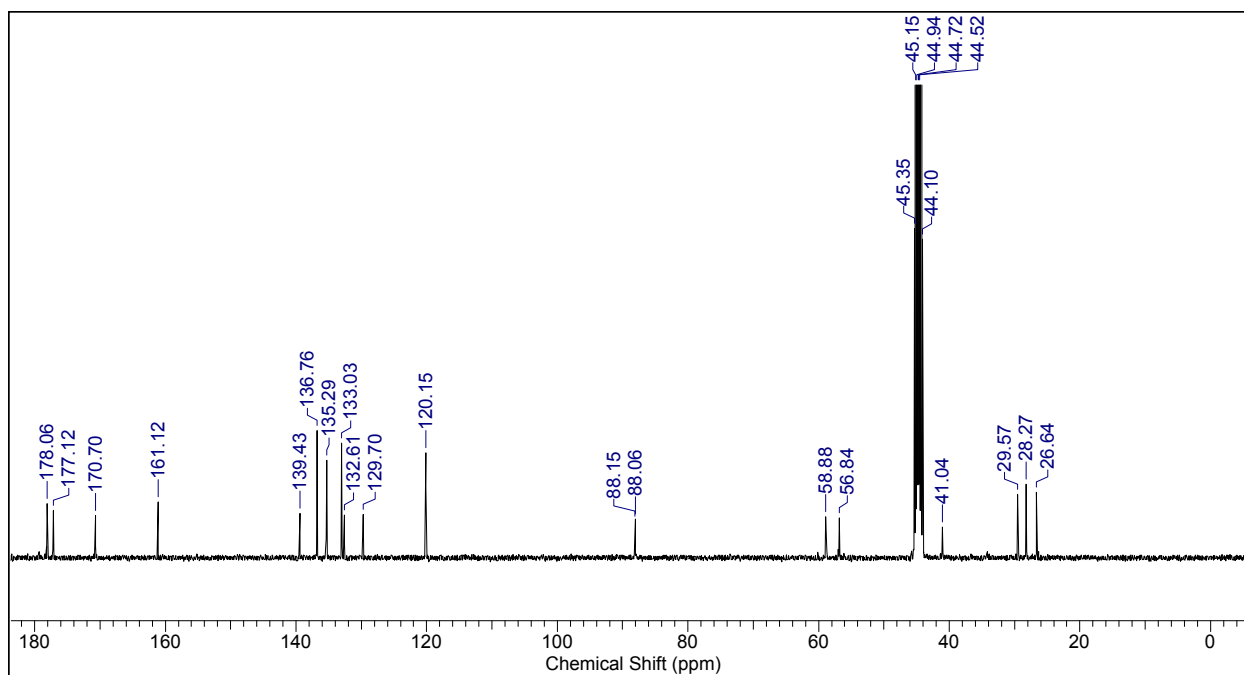


Fig. S19 ^{13}C NMR spectrum (100 MHz, $\text{DMSO-}d_6$) of compound **2**.

4. Mass Spectra of all synthesized compounds:

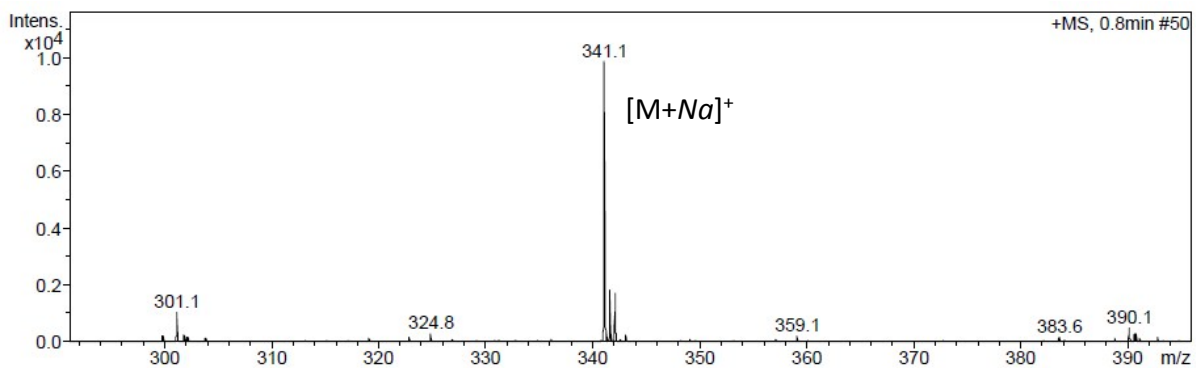


Fig. S20 ESI-MS spectrum of compound **8**.

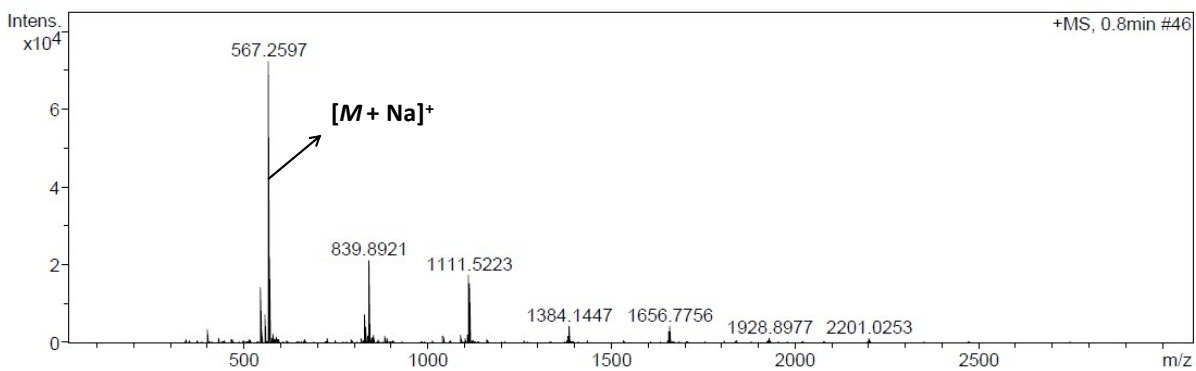


Fig. S21 ESI-MS spectrum of compound **10**.

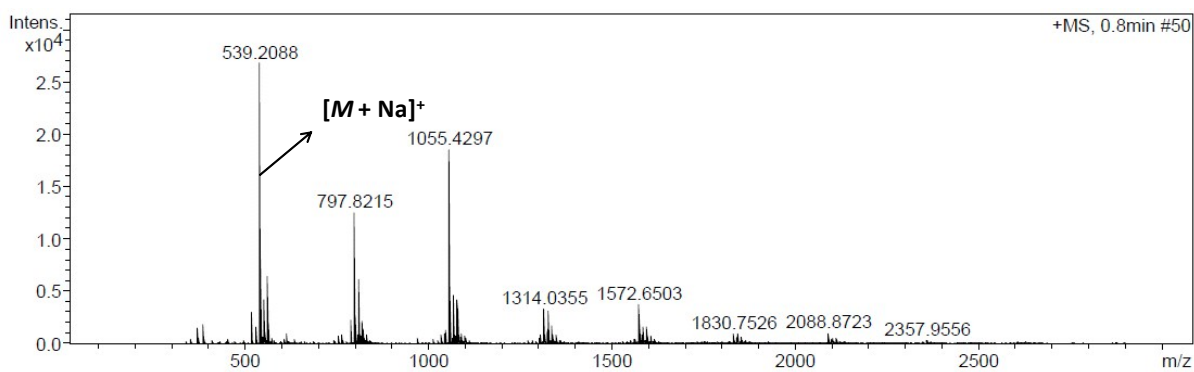


Fig. S22 ESI-MS spectrum of compound 11.

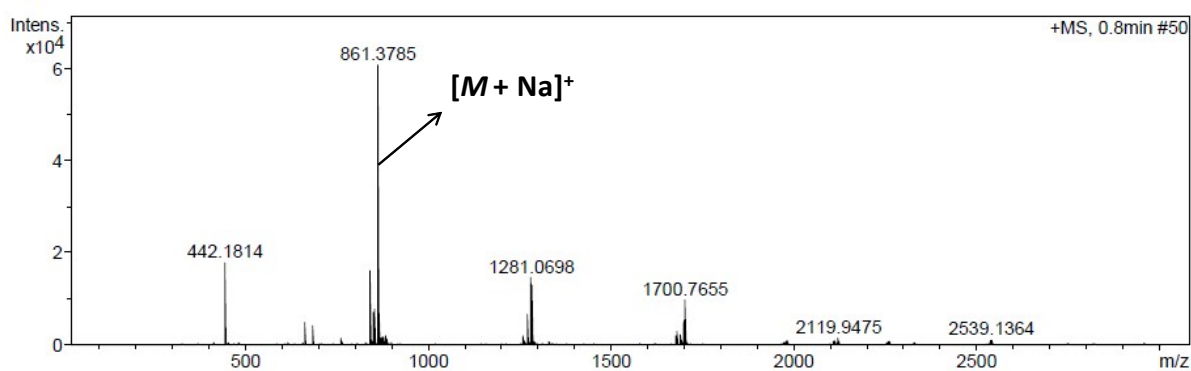


Fig. S23 ESI-MS spectrum of compound 12.

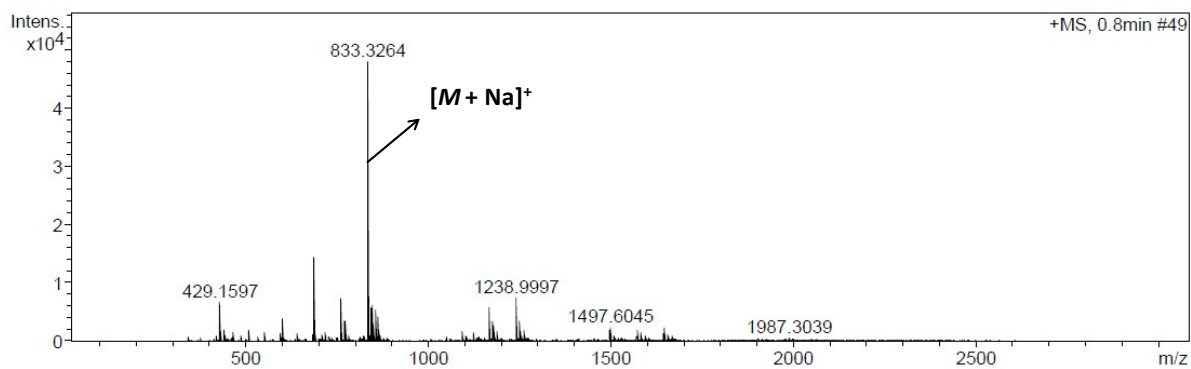


Fig. S24 ESI-MS spectrum of compound 1.

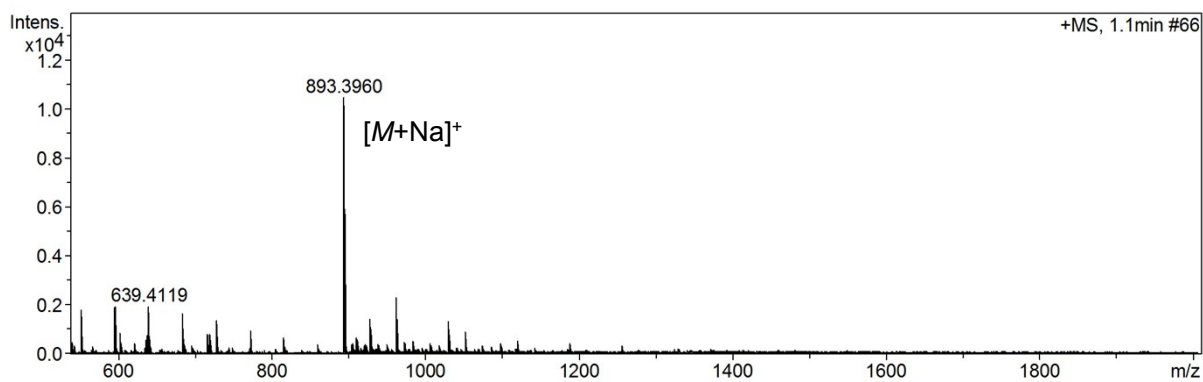


Fig. S25 ESI-MS spectrum of compound 13.

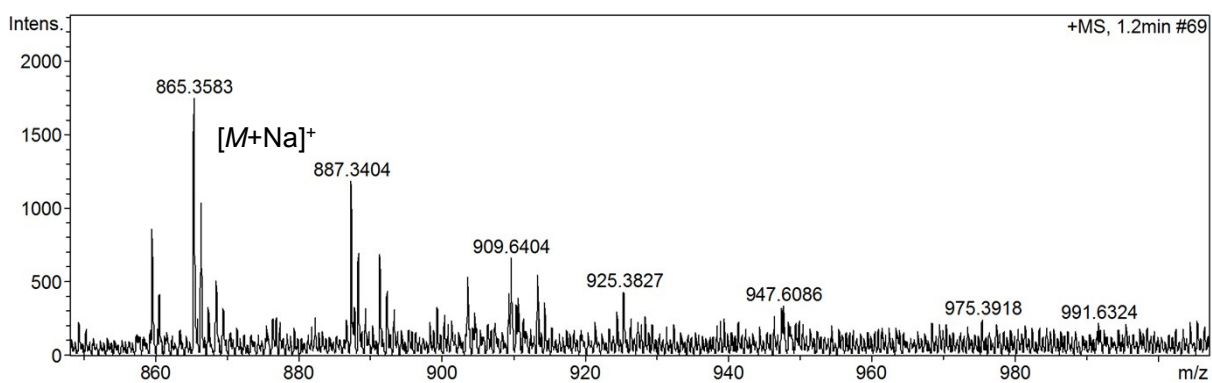


Fig. S26 ESI-MS spectrum of compound 2.